

Version With Markings to Show Changes Made

CLAMSHELL UF CENTRIFUGAL FILTER VESSEL AND METHOD

Reference to related application

This application is related to, and claims the benefit under 35 USC 119(e) of, United States Provisional Application Serial No. 60/236,078, filed by applicants on September 28, 2000 and entitled Clam Shell UF Centrifugal Filter. That patent application is hereby incorporated herein by reference in its entirety.

Statement Regarding Federally Sponsored Research or Development

This invention was made with U.S. government support under NIH Grant No. 2R44-RR12066-02A1.

Field of the Invention

The present invention relates to filter vessels for centrifugal ultrafiltration.

Background

It is well known to separate components of a fluid by centrifuging. Portions of different density separate in a column along the centrifugal gradient. A related development employs the centrifugal pressure to more effectively drive components of a fluid through a filter bed or sheet. Typically, this is done with special vessels or filter plate assemblies, that are constructed to fit a standard centrifuge drum, and often to hold a standard aliquot of the sample that is to be filtered. Ultrafiltration involves the separation of colloidal or large molecule material. A filter, such as a microporous membrane, allows solute and smaller molecular weight materials to pass from the vessel, while retaining the larger molecules of interest.

Centrifugal ultrafiltration relies on the pressure of a fluid head to drive the solvent and solutes through the filter, and thus may operate at a rate that varies over time as concentration proceeds. While certain microporous membranes may have a very high total effective filtration area, the pore sizes may be quite small, e.g., ten to five hundred nanometers, so that quite high driving force may be necessary as the separation proceeds. Moreover, in many fields of interest, such as separation or purification of proteins and biological molecules, the material of interest may be present in a concentration well under one percent, and may reside in a sample amounting to a few milliliters or less. In these circumstances, a number of factors of vessel and filter materials and construction may have relatively large adverse effects on the speed, efficiency and cost of ultrafiltration.

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